A's expectation is $\left\{\frac{8}{13}\right\}^2$ of \$30—\$10$=$\$$11\frac{61}{169}$—\$10$=$\$$1\frac{61}{169}$.

B's expectation is $\left\{\frac{56}{(13)^2}\right\}$ of \$30—\$10$=$\$$9\frac{159}{169}$—\$10$=-$\$$\frac{10}{169}$.

C's expectation is $\left\{\frac{7}{13}\right\}^2$ of \$30—\$10$=$\$$8\frac{118}{169}$—\$10$=-$\$$1\frac{51}{169}$.

MISCELLANEOUS.

Conducted by J. M. COLAW, Monterey, Va. All contributions to this department should be sent to him.

PROBLEMS.

5. **Proposed by Professor G. B. M. ZERR, A. M., Principal of Schools. Staunton, Virginia.**

A cubic mile of saturated air at 18°C. is cooled to a temperature of 10°C. How many tons of rain will fall?

6. **Proposed by H. C WHITAKER, B. S., M. E., Professor of Mathematics, Manual Training School, Philadelphia, Pennsylvania.**

Two men wish to buy a grindstone 42 inches in diameter and one foot thick at the center. To what thickness at the outer edge should the stone uniformily taper from the center that each man may grind off 18 inches of the diameter and both have equal shares, the central six inches of the diameter being waste?

7. **Proposed by Rev. A. L. GRIDLEY, Pastor of Congregational Church, Kidder, Missouri.**

Making no allowance for the curvature of the earth and supposing the sun to rise in the east and set in the west, what would be the course of a man who should walk constantly toward the sun from morning until night? How far and in what direction from the starting point would he be, walking three miles per hour, at the end of three days?

QUERIES AND INFORMATION.

Conducted by J. M. COLAW, Monterey, Va. All contributions to this department should be sent to him.

Note to Professor Dickson's Article on Triangles, by Josiah H. Drummond, Portland, Maine.

The late Judge, Josiah Scott, of the Supreme Court of Ohio, published in 1871 a pamphlet (in which he modestly said, in substance, that while the Mathematician might find nothing new in it, yet the Student might not find it wholly without interest) demonstrated that $2mn$, m^2-n^2, and m^2+n^2 give the "lowest intergers representing sides of a right angled triangle" when m and n are any numbers, one odd and one even, and *prime to each other* and $m>n$.

This rule has seemed to me the most practical of any that I have seen.

A Comment from H. C. WHITAKER, B. S. M. E., Professor of Mathematics, Manual Training School, Philadelphia, Pennsylvania.

In the query of L. B., page 27, of No. 1, L. B. asks why the value 5 which he obtains by "solving" does not prove. The reason is not, as stated by the editor, that the radical must be taken with the double sign because then the question would at once come,—what is the valu of x when $+\sqrt{x+4}=+\sqrt{x-4}+4$, the plus sign in front of the radicals indicating without any ambiguity that the positive value of the radical is taken. Should the editor say that it is impossible to so indicate the positive root of a quadradic surd as his remarks on page 28 would imply, the reply would be that $3+\sqrt{2}$ is always consided totally distinct from $3-\sqrt{2}$ and if true of 2 most certainly is true of $x-4$.

The answer to L. B.'s query is that he did not get the value 5 or any other value by "solving"; he simpiy made a mistake in his work, introducing a root.

To illustrate, take $x=-3$.

Square, $x^2=9$

Extract Square Root, $x=3$

which will not prove. The error in the above is obvious. The equation is squared when neither side was zero.

By making every possible change of sign in the radicals

$$+\sqrt{x+a}+\sqrt{x-a}-a=0 \text{ or } k \text{ or } l \text{ or } m$$
$$+\sqrt{x+a}-\sqrt{x-a}-a=n \text{ or } 0 \text{ or } p \text{ or } q$$
$$-\sqrt{x+a}+\sqrt{x-a}-a=r \text{ or } s \text{ or } 0 \text{ or } t$$
$$-\sqrt{x+a}-\sqrt{x-a}-a=u \text{ or } v \text{ or } w \text{ or } 0$$

Multiplying all four, $4a^2+a^4-4a^2x=0$ or $x=\dfrac{a^2+4}{4}$.

It will be seen that the resulting equation being of the first degree, there is only one root for all four equations; as the editor says,— when a is between $+\infty$ and $+2$, the first form reduces to zero; between $+2$ and 0, the second form; if a is between 0 and -2 the third form will reduce to zero and between -2 and $-\infty$ the fourth form.

The editor's explanation is also unsatisfactory from the fact that it will not explain the same conditions existing in equations containing surds of third degree and higher orders.

The subject has been quite well discussed by Mr. W. G. Horner, (of Horner's Method fame) in *Philosophical Magazine*, January—June, 1836-8, page 43, etc.

NOTES.

Rev. Joseph Bayma, S. J., late Professor of Mathematics in Santa Clara College, Santa Clara, California, and author of a series of text-books, including *Elements of Infinitesimal Calculus* (1889), died nearly two years ago. This late notice may be of interest to some of our subscribers who are using his text-books. J. M. C.

Professor B. F. Burleson, of Oneida Castle, New York, so well known to many of our subscribers on account of his numerous contributions to the Mathematical Journals of this country, has been at the Hospital at Utica, since August last, taking a course of treatment for paralysis. He has been compelled to give up all Mathematics and correspondence. J. M. C.